

REMARKS

Currently, claims 1-5, 26-31, and 34-35 are pending in the application. Claim 34 has been amended. The continued consideration of the pending claims is respectfully requested in light of this amendment and the following remarks.

Rejection under 35 U.S.C. § 112

The Examiner has rejected claim 34 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to point out particularly and distinctly claim the subject which Applicants regard as their invention. Specifically, the Examiner believes that it is not readily ascertainable how the recitation of a peel force limits the adhesive composition of claim 1. Applicants have herein amended claim 34. As amended, claim 34 now clearly indicates that the adhesive composition, when adhered to a Yankee dryer, exhibits a peel force quantified within a stated range. In addition, the units of the stated peel force have been amended to specify the value in "grams per 12 inches of fibrous web." With these amendments, Applicants believe that claim 34 is not indefinite and distinctly claims additional subject matter as dependent on claim 1. Applicants therefore respectfully request that this rejection be withdrawn.

Rejections under 35 U.S.C. § 103(a) over Hollenberg et al.

The Examiner has rejected claims 1-3, 26, 29-31, and 34-35 under 35 U.S.C. § 103(a) as obvious over Hollenberg et al, U.S. Patent No. 5,246,544. Specifically, the Examiner believes that the polysaccharides disclosed by Hollenberg et al. are generic to and imply that any organic polymer, including those containing amine moieties as

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claimed in the present application, would have been obvious to one of ordinary skill in the art as adhesive compositions. Applicants respectfully traverse this rejection.

Applicants submit that one of ordinary skill in the art would not be motivated to modify the teachings of Hollenberg et al. to achieve the claimed invention. There is no teaching or suggestion in Hollenberg et al. that zirconium-containing compounds can be used to crosslink the amine-containing moiety of the present claims. The functional groups disclosed by Hollenberg et al. for its polymers, such as hydroxyl, carboxyl, sulfonate, sulfate, and phosphate, contain active hydrogens that are Brønsted acids. See col. 6, ln. 36-39. The polymers disclosed by and claimed in the present application, however, contain active primary and secondary amine moieties that are Lewis bases.

Because of this acid-base distinction, Applicants submit that one of ordinary skill in the art would not be motivated to modify the teachings of Hollenberg et al., which discloses acidic functional groups, with the polymers containing basic functional groups of the present application. The Examiner has failed to establish that the skilled artisan would be motivated to modify the acidic functional groups of Hollenberg et al. with basic functional groups claimed in this application to achieve the crosslinkable creping adhesive formulation. Applicants therefore respectfully request that this rejection be withdrawn.

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Rejections under 35 U.S.C. § 103(a) over Greer et al. and Aston et al.

The Examiner has rejected claims 1-5, 26-31, and 34-35 under 35 U.S.C. § 103(a) as obvious over Aston et al., U.S. Patent No. 5,246,548, in combination with Greer et al., U.S. Patent No. 5,230,774. Specifically, the Examiner alleges that Aston et al. teaches the control or prevention of pitch deposits by spraying a water-soluble cationic or anionic polymer, including an epiamine polymer, on paper or equipment surfaces. In addition, the Examiner contends that Greer et al. discloses the use of a cationic polymer and a zirconium compound crosslinking agent to control or prevent pitch deposits. By combining these two patents, the Examiner asserts that one skilled in the art would be motivated to use the zirconium compounds and cationic polymer of Greer et al. in the system presented by Aston et al., thus rendering obvious the pending claims of the instant application. This rejection is respectfully traversed.

To establish a *prima facie* case of obviousness, the Examiner must prove the existence of three criteria: (1) some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference teachings; (2) a reasonable expectation of success; and (3) that the reference teaches or suggests all the claim limitations. See MPEP § 2143. Applicants submit that the rejection maintained by the Examiner does not meet at least the third requirement of a *prima facie* obviousness case.

The Examiner has not established a *prima facie* case of obviousness based on the combination of Aston et al. and Greer et al. because those references do not teach or suggest all of the claim limitations. Claim 1, the only pending independent claim, requires a crosslinking agent for crosslinking an organic polymer to a fibrous web.

Applicants submit that neither Aston et al. nor Greer et al. teach this claimed crosslinking agent.

Aston et al. discloses a method of controlling the pitch deposits on papermaking machinery by spraying cationic and anionic polymers onto the machine surfaces that are not in continuous contact with water. See col. 2, ln. 25-42. However, the reference never teaches or suggests the use of a crosslinking agent. In fact, the preferred cationic polymers disclosed in Aston et al. are protonated (see col. 2, ln. 69) and thus would not react with Applicants' claimed zirconium-containing crosslinking compounds. As a result, Aston et al. neither teaches nor suggests the claimed crosslinking agent.

Likewise, Greer et al. does not teach a zirconium-containing compound used as a crosslinking agent. This reference teaches a process for controlling pitch deposits by adding, prior to cellulosic pulp sheet formation, the combination of a zirconium compound and a cationic polymer. See col. 2, ln. 31-37. Greer et al. specifies that its two components may be added separately to the pulp (see col. 2, ln. 38-40) or added simultaneously (see col. 2, ln. 58-60). As previously established by the 37 C.F.R. § 1.132 Declaration of Phuong Van Luu dated February 2, 2000, the mixing of the two compounds as suggested by Greer et al. would result in an inoperable, undesirable gel. This Declaration, in combination with the fact that Greer et al. does not teach or suggest the creation of a gel, reveals that the Greer et al. process never results in the crosslinking of the zirconium compound with the cationic polymer. If Greer et al. did suggest and desire the creation of such a gel, it certainly would be ineffective in controlling the pitch deposits as the gel would clog the papermaking system.

To explain further how Greer et al. does not use crosslinked compounds to achieve its invention, Applicants call to the Examiner's attention two references presented in the Information Disclosure Statement filed concurrently herewith. First, U.S. Patent No. 4,950,361 to Bender et al. relates to the use of water soluble zirconium compounds in preventing pitch deposits in papermaking processes. This reference explains that these compounds operate "through the reaction of the hydrolyzed zirconium(IV) ion with the oxygenated functional groups on the polymers that make up the stickies." Col. 3, ln. 5-9. This reaction itself creates a crosslink between the zirconium ion and the pitch-causing polymers to render them less tacky. See col. 3, ln. 10-15. Under this mechanism, the zirconium compound of Greer et al. would not crosslink with the cationic polymer, but instead crosslinks with the pitch for removal.

Second, Kelly L. Magee and James L. Taylor, in an article presented at the 1994 TAPPI Papermakers Conference, postulate that cationic polymers operate to control pitch electrostatically by occupying the anionic charge sites on the pitch droplet surfaces. See p. 621, col. 2, para. 4. Under this proposed mechanism, the cationic polymers of Greer et al. still do not crosslink with the zirconium compound, but instead react electrostatically with the pitch to facilitate its removal from the pulping system.

The '361 patent and the article combine to suggest that Greer et al. does not rely at all on any interaction between the cationic polymer and the zirconium compound, but actually teaches a process wherein the two compounds work independently and in different ways to control and remove pitch effectively from cellulosic pulp. Because these two compounds follow different mechanisms to control pitch, they achieve the

desired "synergistic blend" of Greer et al. See col. 2, ln. 13-14. Therefore, the synergy is not achieved because of any crosslinking between the disclosed compounds.

In addition, Greer et al. specifies in its preferred embodiment that the cationic polymer is optionally crosslinked with a small amount of ammonia prior to its introduction to either the zirconium compound or the pulp slurry. See col. 6, ln. 61-66. If the cationic polymer is already crosslinked to ammonia, Applicants submit that it cannot be expected to further crosslink with the zirconium compound. Because the reference allows this form of crosslinking, Greer et al. cannot further suggest the crosslinking of its zirconium compound and its cationic polymer.

Another indication that Greer et al. neither teaches nor suggests the claimed crosslinking agent lies in the different focus of its disclosure from the present invention. The claims of this application are directed to a creping adhesive, a compound to foster the controlled adhesion of fibrous webs to paper drying machines. The claimed crosslinking agent serves to crosslink an organic polymer to a fibrous web for this purpose. On the other hand, Greer et al. is directed to pitch control, a method for preventing the adhesion of unwanted materials to paper-making machinery. A crosslinking agent in the Greer et al. method would be undesirable as it would promote the adhesion of the fibrous web to the paper-making machinery, contrary to its purpose of preventing adhesion. Thus, Greer et al. does not teach or suggest the claimed crosslinking agent because fostering the adhesion of the fibrous web to the paper-making machinery runs contrary to its stated purpose of preventing any such adhesion.

For all of these reasons, Greer et al. does not teach or suggest the claimed crosslinking agent. Therefore, as neither Aston et al. nor Greer et al. teach or suggest

this claim limitation, the Examiner has not proven a *prima facie* case of obviousness and Applicants respectfully request the withdrawal of this rejection.

Conclusion

In view of the foregoing amendments and remarks, Applicants respectfully request the reconsideration and the continued examination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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